

February 27, 2017

Mr. Normand Gamache, Jr. P.L.S
Guerriere & Halnon, Inc.
1029 Providence Road
Whitinsville, MA 01588

SUBJECT: Traffic Impact & Access Study
Proposed Residential Development
Institute Road – Grafton, Massachusetts

Dear Mr. Gamache:

In response to concerns from the Town regarding the benefits of adding a right turn lane to the Institute Road approach to Westboro Road, GPI has prepared the following response.

The delay that is incurred on a side street is related to the amount of time spent waiting for an available gap in the mainline traffic to exit the side street. When traffic volumes are high on the mainline, there are fewer gaps in traffic that are of adequate length for a vehicle to exit the side street. As a result, long delays and queues can occur on the side street. By adding a second lane on the side street, two vehicles are able to utilize the same gap in traffic (one turning left and one turning right) to exit the side street. This thereby reduces the number of gaps needed for vehicles to exit the side street, reducing the total time cars have to wait and the queues exiting the side street. So by adding a right-turn lane, we are allowing cars to stack side-by-side in two lanes instead of one, allowing right and left-turning vehicles to exit Institute Road at the same time.

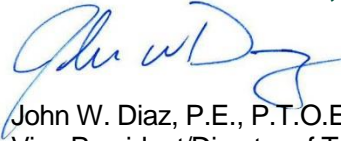
For example, if there are 5 vehicles in a queue and the 1st and last vehicle are turning left. The last vehicle must wait for all 4 vehicles to safely negotiate their respective turn before arriving at the stop line. If a dedicated right turn lane is provided, the 3 right turning vehicles are in a separate lane and the left turning and right turning can be processed simultaneously, resulting in the last left turning vehicle arriving at the stop line sooner, only needing to wait for 1 vehicle to turn left. Therefore, the delays are reduced and the capacity of the approach is increased.

As an analogy, one can think of a grocery store with a single cash register and a long line of patrons waiting to pay. If the lines get long enough, typically an additional register (or lane) is opened to reduce the delay for all patrons and create two shorter lines rather than one long line. Essentially two customers are processed in the same amount of time it previously took to process a single customer.

Should you have any additional questions, please don't hesitate to contact me at (978) 570-2953 or Rebecca Brown at (978) 570 -5707.

Best regards,

GREENMAN-PEDERSEN, INC.



John W. Diaz, P.E., P.T.O.E.
Vice President/Director of Traffic Engineering

c. R. Brown, GPI via email